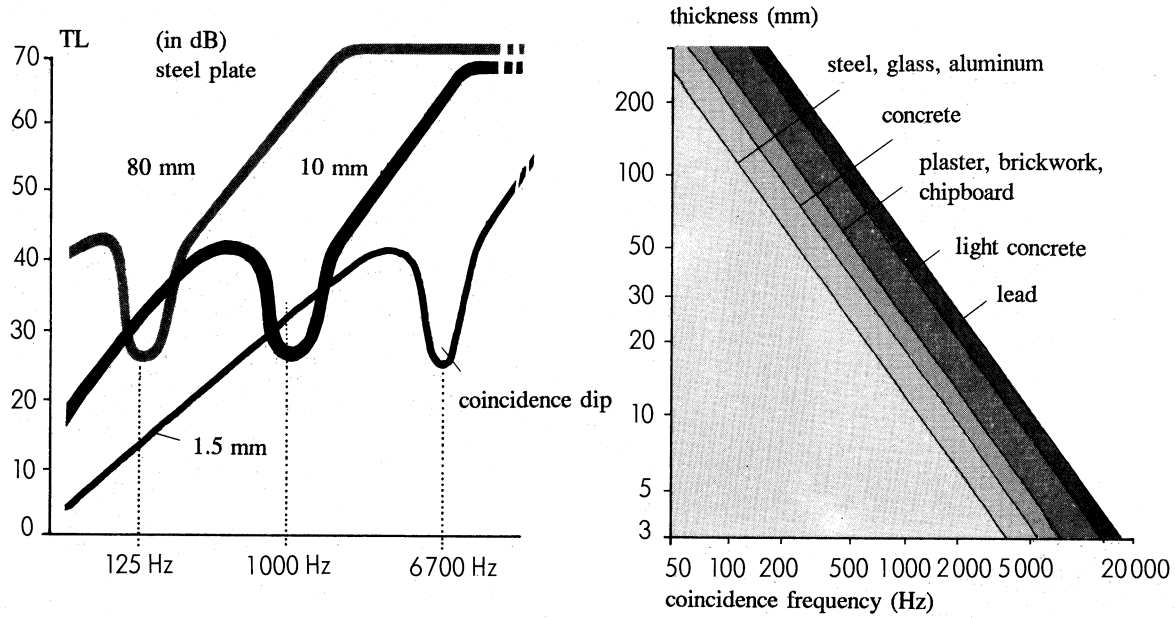
A SINGLE WALL PROVIDES POOR SOUND INSULATION AROUND A CERTAIN FREQUENCY

At frequencies near the *critical* or *coincidence* frequency, the transmission loss of the wall is reduced. At frequencies above the coincidence frequency, the TL will increase again. Only if the wall has high internal damping will the depth of the coincidence dip be reduced. At 1000 Hz, a 1.5 mm thick steel plate gives better insulation than a 10 mm thick plate.

Principle



Application with light single walls.

Example

Behind one end wall in a long factory room are a number of machines with an intense noise level peaking at around 1000 Hz. The end of the room is isolated with a wall of 25 mm thick chipboard and 6 mm thick glass. The isolation is ineffective since the chipboard has its coincidence frequency at 1000 Hz while the corresponding frequency for the 6 mm glass is at 2000 Hz.

Control Measure

The chipboard is replaced by two layers of 9 mm plasterboard. Isolation is improved by about 10 dB. The plasterboard weighs about the same as one 25 mm thick chipboard, but it is less than one-fourth as rigid. Its concidence dip is located at 2500 Hz.